

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 17

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MATTHEW R. FEULNER

Appeal No. 2002-0538
Application 09/220,468

ON BRIEF

Before FRANKFORT, MCQUADE, and NASE, Administrative Patent Judges.

MCQUADE, Administrative Patent Judge.

DECISION ON APPEAL

Matthew R. Feulner appeals from the final rejection of claims 1 through 21, all of the claims pending in the application.

THE INVENTION

The invention relates to a gas turbine engine which is defined in representative claims 1 and 10 as follows:

1. A gas turbine engine having a compressor section, a combustor section, and a turbine section enclosed in an engine case with an annular flow path extending axially therethrough,

said compressor section having a plurality of rows of rotating blades alternating with a plurality of rows of stationary vanes, said gas turbine engine comprising:

a groove formed in said engine case of said compressor section and extending substantially circumferentially therethrough,¹ said groove being substantially adjacent to one row of said plurality of rows of rotating blades, said groove being in fluid communication with said turbine section for channeling cooling air from said compressor section to said turbine section to increase stability of said gas turbine engine.

10. A gas turbine engine having a compressor section, a combustor section, and a turbine section enclosed in an outer shroud with an annular flow path extending axially therethrough, said compressor section having a plurality of rows of rotating blades alternating with a plurality of rows of stationary vanes, each said row of rotating blades includes a plurality of blades, each said blade having a blade tip defining a tip clearance between said tips of said blades and said outer shroud, said gas turbine engine comprising:

said outer shroud of said compressor section defining an opening, said opening being substantially adjacent to one row of said plurality of rows rotating blades, said opening being in fluid communication with said turbine section for extracting air from said tip clearance of said row of rotating blades of said compressor section to be routed to said turbine section to increase stability of said gas turbine engine.

¹ Reading the claims in light of the underlying disclosure (see specification page 5 and drawing Figures 3 and 4), we understand the somewhat inaccurate recitation in claim 1 that the groove in the engine case extends substantially circumferentially "therethrough," and the comparable recitations in independent claims 14 and 21, as requiring the groove to extend substantially circumferentially "in" or "within" the case. In the event of further prosecution, the appellant should amend the claims to eliminate this discrepancy with the disclosure.

THE PRIOR ART

The references relied on by the examiner to support the final rejection are:

Uehling	3,641,766	Feb. 15, 1972
Cureton et al. (Cureton)	4,702,070	Oct. 27, 1987
Coffinberry et al. (Coffinberry)	5,918,458	Jul. 6, 1999

THE REJECTIONS

Claims 1, 2 and 6 through 21 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Uehling in view of Cureton.

Claims 3 through 5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Uehling in view of Cureton and Coffinberry.

Attention is directed to the appellant's main and reply briefs (Paper Nos. 12 and 14) and to the examiner's answer (Paper No. 13) for the respective positions of the appellant and the examiner with regard to the merits of these rejections.

DISCUSSION

Uehling, the examiner's primary reference, discloses a turbojet gas engine 10 comprising a housing 12, a compressor 14, a combustion system 16, a turbine 18, a tail pipe 19 and an exhaust nozzle 20. As is conventional, both the compressor 14 and turbine 18 include alternating rows of rotating blades and

stator vanes. The engine also comprises a thrust modulator which operates without the necessity of reducing engine speed. In Uehling's words,

[a]s shown schematically in FIG. 3, the turbojet engine 10 is provided with a bypass pipe 24 having a valve 26 interposed therein. One end of the bypass pipe 24 is connected to the compressor 14 near its discharge end, and the valve 26 is actuated by the pilot to bleed off a certain percentage of compressor discharge air thereby reducing the mass flow through the combustion system 16 and the turbine 18. A portion of this bleed air is provided to a turbine cooling flow path 27 from which it is delivered to various components of the turbine 18 to cool the same. . . .

. . . [T]he remaining portion of the bleed flow within the pipe 24 is piped from compressor discharge to the turbojet tail pipe 19 forward of the exhaust nozzle 20 and downstream of the turbine 18 . . . through thrust spoiling means, generally designed by the numeral 28, as shown in FIG. 3.

As shown in both FIG. 3 and FIG. 4, the thrust spoiling means 28 take the form of a plurality of swirl inducing nozzles 30 positioned within a manifold 32, to which the bleed pipe 24 is connected. By means of the swirl inducing nozzles 30 the bleed flow is introduced into the tail pipe 19 so as to maximize swirl of the gas flowing within the tail pipe 19, thereby significantly increasing the tail pipe pressure and momentum losses and reducing the nozzle thrust coefficient, which, in turn, causes an instantaneous and additional increment of thrust reduction [column 3, line 54, through column 4, line 14].

Figure 3 shows Uehling's bypass pipe 24, which channels cooling air from the compressor 14 to the turbine 18 via flow path 27, as communicating with the compressor at a position adjacent the tip clearance area of a row of rotating blades. As

conceded by the examiner (see page 4 in the answer), however, Uehling does not specify the nature of the interface between the compressor 14 and the pipe 24, and thus does meet the limitations in independent claims 1, 14 and 21 relating to the groove(s) in the engine case or shroud. The examiner nonetheless concludes that

[i]t . . . would have been obvious to use either an annular groove, plural annular groove segments or plural holes as the openings in the Uehling reference. While the Uehling reference does not teach a specific shape for the opening one of ordinary skill would realize that the opening is either a single opening (an annular groove) or plural openings (interrupted grooves or plural opening[s]). Therefore, it would have been obvious to use an opening shape which would be easy to manufacture. It also would have been obvious to one of ordinary skill in the art to use plural grooves, either around a single rotor blade set or around plural blade sets in order to provide an increased protection against compressor surge and stall [answer, pages 4 and 5].

Rejections based on 35 U.S.C. § 103(a) must rest on a factual basis. In re Warner, 379 F.2d 1011, 1017, 154 USPQ 173, 177-78 (CCPA 1967). In making such a rejection, the examiner has the initial duty of supplying the requisite factual basis and may not, because of doubts that the invention is patentable, resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in the factual basis. Id. The foregoing rationalization advanced by the examiner to justify the rejection

of claims 1, 14 and 21 is rife with speculation and unfounded assumptions having no factual support in the fair teachings of Uehling. Because these evidentiary insufficiencies find no cure in Cureton, the combined teachings of the two references do not warrant a conclusion that the differences between the subject matter recited in claims 1, 14 and 21 and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art.

Accordingly, we shall not sustain the standing 35 U.S.C. § 103(a) rejection of claims 1, 14 and 21, and dependent claims 2, 6 through 9 and 15 through 19, as being unpatentable over Uehling in view of Cureton.

As Coffinberry does not overcome the deficiencies of the Uehling-Cureton combination with respect to the subject matter recited in claim 1, we also shall not sustain the standing 35 U.S.C. § 103(a) rejection of claims 3 through 5, which depend ultimately from claim 1, as being unpatentable over Uehling in view of Cureton and Coffinberry.

At issue in the rejection of independent claim 10 are the limitations therein relating to the "opening." As indicated above, claim 10 requires an opening, rather than a groove, in the

outer shroud of the compressor section substantially adjacent to one row of rotating blades and in fluid communication with the turbine section for extracting air from the tip clearance of the blades to be routed to the turbine section to increase stability of the engine. Although Uehling does not specify the nature of the interface between the compressor 14 and the pipe 24, it is not disputed that this interface must include at least one opening in the shroud (housing 12). Uehling's Figure 3, which shows bypass pipe 24 communicating with the compressor 14 through the shroud at a position adjacent the tip clearance area of a row of rotating blades, belies the appellant's argument that "Uehling does not teach that the bleed air is extracted through an opening that is substantially adjacent to a row of rotating blades" (main brief, page 7). Although patent drawings are not working drawings, things shown clearly therein are not to be disregarded, even if unexplained by the specification. In re Mraz, 455 F.2d 1069, 1072, 173 USPQ 25, 27 (CCPA 1972). Due to its position, Uehling's opening(s) would necessarily extract air from the tip clearance area of the rotating blades, and the resulting reduction in tip clearance leakage would inherently increase the stability of the engine to the same extent that the extraction of

air from the tip clearance area of the appellant's compressor section does (see pages 5 and 6 in the appellant's specification).

Hence, notwithstanding the appellant's arguments to the contrary, Uehling would have suggested a gas turbine engine responsive to the "opening" limitations in claim 10. Since Uehling meets all of the other limitations therein, we shall sustain the standing 35 U.S.C. § 103(a) rejection of claim 10 as being unpatentable over Uehling in view of Cureton, with the application of Cureton being, at worst, superfluous.

Finally, we shall sustain the standing 35 U.S.C. § 103(a) rejection of dependent claims 11 through 13 and 20 as being unpatentable over Uehling in view of Cureton since the appellant has not challenged such with any reasonable specificity, thereby allowing these claims to stand or fall with parent claim 10 (see In re Nielson, 816 F.2d 1567, 1572, 2 USPQ2d 1525, 1528 (Fed. Cir. 1987)).

SUMMARY

The decision of the examiner to reject claims 1 through 21 is affirmed with respect to claims 10 through 13 and 20 and reversed with respect to claims 1 through 9, 14 through 19 and 21.

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No time period for taking any subsequent action in
connection with this appeal may be extended under 37 CFR
§ 1.136(a).

AFFIRMED-IN-PART

CHARLES E. FRANKFORT)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
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)	APPEALS AND
JOHN P. MCQUADE)	
Administrative Patent Judge)	INTERFERENCES
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JEFFREY V. NASE)	
Administrative Patent Judge)	

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